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ABSTRACT

The paper reviews the paradoxical nature of idiots savants, persons who, although retarded, have exceptional skills in certain areas. Various explanations for the phenomenon are discussed, such as a specific genetic endowment, a specialized compensatory response to general intellectual deficiency, and possession of an eidetic memory. Various categories of exceptional skills are presented; they include calendar calculating, artistic ability, musical ability, memorization of obscure facts, mathematical abilities, mechanical ability, and sensory discrimination abilities. Also described are the similarities between autistic children and idiots savants. Suggestions are made for educating idiots savants so that their learning deficits are upgraded while their special skills are developed to the fullest. (Author/DB)

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Idiots Savants: Retarded and Gifted

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Abstract

This paper reviews the paradoxical nature of idiots savants, persons who, although retarded, are also gifted. Their specific talents exceed those of normal individuals, while in other areas idiots savants are deficient. Various explanations for the phenomenon are discussed, such as a specific genetic endowment, a specialized compensatory response to a general intellectual deficiency, and possession of an eidetic (photographic) memory. Various categories of exceptional skills are presented. Also described are the similarities between autistic children and idiots savants. The paper concludes with educational implications of idiots savants.

In the literature on mental retardation, there are references to intriguing cases of individuals who, although unable to manage their daily lives independently, are nevertheless capable of remarkable mental feats in specific areas of endeavor. Briefly described, an idiot savant has an extraordinary, specific talent, such as calendar calculating, a specialized musical skill, or an outstanding memory for specific information. The particular skill possessed exceeds that of normal people with training in that area, while in other areas the idiot savant is deficient. Such cases are very rare, approximately 0.06% of all institutionalized retarded (Hill, 1977). Their specific areas of expertise cover a wide range of human abilities.

The use of the term *idiot savant* presents problems as the individuals so labeled are neither idiots nor savants. *Idiot* is an archaic term which, in the early days of IQ testing, referred to IQs below 30. But few idiots savants actually test that low. Duckett (1977), for instance, reported that 6 of 25 institutionalized savants had IQs below 40.

Referring to these retarded individuals as *savants* is similarly troublesome since, lacking a general perspective on life and an insight into their own abilities, they lack the wisdom implied by the term. Some authors favor descriptors such as *talented aments* (Scheerer, Rothmann & Goldstein, 1945) or *paraments* (Nurcombe & Parker, 1963), as being more precise in connotating the limited extent of the area of brilliance than *savant*.

In order to be identified as an idjot savant, the retarded individual's skills are judged against those of the nonretarded population, not

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against those of retarded peers. Furthermore, those skills much surpass, not only the norm for the general population, but also the standards achieved by normal individuals with those particular skills. For example, a retarded individual who can play a recognizable tune on a harmonica would not be considered an idiot savant although most nonretarded people cannot do this. Only if the harmonica playing exceeds that of a proficient harmonica player would the term apply (Hill, 1978). Thus, idiots savants, though being retarded in their general intellectual functioning, are capable of performing at levels usually considered gifted in certain, specific skill areas. They can be defined as "mentally retarded persons demonstrating one or more skills above the level expected of nonretarded individuals" (Hill, 1978, p. 281).

General versus Specific Abilities

The discrepancy in levels of functioning observed in idiots savants raises questions about the theoretical relationship between general abilities and specific talents, reminiscent of the wide-ranging debate between Spearman (1927) and Terman (1925) on the one hand, and Thurstone (1947) and Guilford (1967) on the other, about the pervasiveness of a general underlying factor in intelligence. Idiots savants appear to be clear examples of the argument that specific talents exist separate from general intellectual ability. Consistent with the view that specific talents can develop to a high level while other abilities remain deficient are multifactor definitions of giftedness such as that of Marland (1971): Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas: (a) general intellectual ability, (b) specific academic aptitude, (c) creative or productive thinking, (d) leadership ability, (e) visual and performing arts, and (f) psychomotor ability.

Within the context of this definition, a child does not have to excel in all areas to be considered gifted. On the contrary, promise of actual achievement in only one of the itemized areas is sufficient to meet the criteria of giftedness. Furthermore, no lower limits of ability are stipulated in areas of non-giftedness. It seems possible to argue, then, that idiots savants, though retarded, are also gifted (Bergman & DePue, 1986). Some idiots savants, such as Japanese artist Yoshihiko Yamamoto, have indeed become famous for their outstanding work (Morishima, 1974).

Theoretical Explanations

Although the phenomenon of the idiot savant has intrigued professionals for a long time (many case studies are documented in the literature), relatively little is known about the organization or development of the exceptional abilities, or the nature of the mental functioning in-

volved. Various theories have been advanced to account for idiots savants. These explanations have included deficit-oriented as well as ability-oriented approaches (Hill, 1978). In the former, development of specific abilities is explained as a reaction to areas of deficiency such as lack of abstract ability (concrete thinking), impoverished environment (sensory deprivation) or retardation per se (compensation). In the latter, idiots savants are assumed to develop special skills as a result of their superior abilities, either inherited, or facilitatory (memory and concentration). Several theoretical explanations are discussed in the following paragraphs.

Concrete thinking. In a detailed case study of a 17-year-old male, Scheerer, Rothmann, and Goldstein (1945) documented that idiots savants are deficient in ability to deal with abstractions. They hypothesized that, owing to this impairment, the abilities developed are concrete in nature, such as playing melodies by ear, calendar calculation, or arithmetic calculation. These concrete abilities are fragmented or canalized, and do not develop in the normal way.

Sensory deprivation. Hoffman (1971) attributed the unusual ability in mental calendar calculation of a 13-year-old retardate to the elimination or reduction of outer, interfering stimuli. In conditions of sensory deprivation, whether through confinement in an institution or through being in an abnormal psychological state, individuals create their own particular structures and interests, and through repetition, develop unique abilities. These unique abilities then stand out in the individuals' repertoires, and are encouraged further by others.

Compensation. Lindsley (1965) argued that the condition of mental retardation itself leads to the development of specific skills in certain areas. The individual compensates for a general intellectual deficiency by focusing primarily on a functioning mode to the exclusion of others.

Inheritance. Case study accounts of some idiots savants indicate that abilities in calendar calculation (Rosen, 1981), arithmetic calculation (Brill, 1940), and music (Viscott, 1970) develop spontaneously, without deliberate training on the part of parents of other adults. This development would suggest that special abilities of the sort exhibited by idiots savants are inherited.

Eidetic memory. A number of authors explain phenomenal memory for facts, dates, and so forth as being eidetic or photographic in nature. Roberts (1945) and Anastasi and Levee (1960) described individuals with superior memory for personal and historical events, and naming the day of the week for any date since 1915, respectively. The authors found it difficult to explain these feats of memory, except by assuming superior eidetic imagery from which the idiots savants could "read off" data.

Concentration. Whenever individuals spend a great deal of time at an activity, they become proficient at it, and idiots savants are no exception to this. There are frequent accounts in the literature of idiots savants spending long hours absorbed in rehearsing their skill. For example, Morishima (1974) reported that a mentally retarded Japanese artist spent all day "sitting like a Buddha" at his work.

There is no consensus in the literature about which of the above theories best accounts for the idiosyncratic functioning of idiots savants. Each theory has been advanced on the basis of the intensive study of, at best, only a few individuals. Given the diversity of specific excellence among savants, it could well be that no one theory at present can account for all instances of the phenomenon, and that controlled empirical study of the abilities of subgroups of savants may be the precondition for development of a comprehensive multifaceted explanation to cover all cases.

Areas of Expertise

The abilities of idiots savants fall into a number of discrete categories. Some savants exhibit only one type of skill, while others exhibit several. In a survey of the literature, Hill (1974) found 52 reports of savants that he grouped into several categories:

1. *Calendar calculating*. This is probably the best known ability associated with savants. Typically, the individual can name the day of the week on which a specific date has occurred or will occur, or vice versa. The span of years covered varies. For instance, one subject could give the day of the week only for dates between 1900 and 2060 (Smith & Howe, 1985) while another had a range of at least 6,000 years (Horwitz, Kestenbaum, Person, & Jarvik, 1965).

2. *Artistic ability*. Several reports describe savants who have become famous for their artistic ability. Yoshihiko Yamamota for example, is known as "another Van Gogh of Japan" for his superior artistic and graphic skills (Morishima, 1974).

3. *Musical ability*. A number of savants have been so proficient musically that they have rehearsed or played with orchestras (Anastasi & Levee, 1960; Bergman & DePue, 1986). The range of musical ability shown by savants is quite variable and related to the amount and kind of training received.

4. *Memorization of obscure facts*. Savants often remember trivia such as phone numbers, people's birthdays, railroad car numbers and special events. For example, Jones (1926) described a man who could give the population of every urban area in the United States

exceeding 5,000 people. Viscott (1970) described a girl who had memorized entire pages of the phone book.

5. *Mathematical abilities*. Some savants are able to perform arithmetic calculations such as multiplication or square root more quickly than mechanical calculators can. The mathematical abilities are usually very specific. Brill (1940), for example, described a 13-year-old girl who was a whiz at multiplying and dividing but had difficulty with addition and subtraction.

6. *Mechanical ability*. In these cases, the savants are able to work at mechanical tasks, but are unable to explain the processes involved. For example, Hoffman and Reeves (1979) described an institutionalized man who was able to repair appliances such as clocks, electric hot plates, and dishwashers, and build electrical circuits and devices such as lamps, but could not be assessed on tests of mechanical aptitude.

7. *Sensory discrimination*. This is the rarest and most questionable category and includes individuals with exceptional senses of smell and/or touch. For example, Horwitz et al. (1965), described twins who could pick out their own shoes and slippers by smell alone. Hill (1978) refers to anecdotal reports of savants who could split bond paper in two.

Relationship to Autism

Children who in the past were labeled idiots savants are now being increasingly absorbed into the category of autism or childhood psychosis. While not all idiots savants have the behavioral manifestations of autism and not all autistic children the discrepancy between low general mental ability and high specific ability, there is recognition of a large area of commonality between the two diagnoses (Goodman, 1972). Frequently noted general similarities include impaired abstraction, social aloofness, eccentric mannerisms, islands of brilliance and male predominance (Steel, Gorman, & Flexman, 1984). A comparison of categories of exceptional abilities for idiot savants (Hill, 1974) and autistic children (Rimland, 1978) indicates that music, memory, art, mathematics, and mechanical abilities appear on both lists.

Educational Implications

One of the basic goals of education is to develop a child's abilities to the fullest. Often a specific talent may be the avenue for development of deficient areas or for developing a marketable skill. Thus, with idiots savants there is an educational need to build up skills necessary for nor-

mal functioning as well as to develop specific areas of talent which may lead to a means of livelihood.

The highly specialized skills of savants reported in the literature have developed in most instances without specific training in unsupportive environments. Few attempts have been made to systematically nurture these abilities. Where there have been concerted attempts to accommodate the special talents and to provide instruction to improve related skills, the results have been dramatic. A noted example of the positive effect of instruction is provided by Morishima and Brown (1977) in their case study of Shyoichiro Yamamura.

Yamamura's attention span and memory were reportedly very poor, except for insects, which he could watch for hours. Aside from observing insects, his favorite activity as a child was drawing pictures. He could understand others, but did not speak. His IQ was approximately 48-53.

Between the ages of 11 and 19, Yamamura was placed with Motsugi, a special education teacher, who capitalized on Yamamura's interest by providing him with insect specimens and art materials, instructing him in observation skills, and allowing freedom in choice of activities. At the age of 19, Yamamura was placed with another educator, Tsutsumi, who trained retarded persons at home. In addition to furthering Yamamura's interest in insects, he introduced him to new media such as finger painting, and taught self-care skills. Under the tutelage of these two special educators, Yamamura learned to produce superior works of art.

This case study indicates that a retarded individual with a specific aptitude can be taught effectively through special instructional approaches by special educators. Morishima and Brown (1977) stress that specially trained teachers are the key in the development of the special talents of idiots savants. Their teachers not only should be aware of special educational programs and techniques, but also should be sensitized to look for areas of strength. Without such sensitivity, and a systematic search for islands of talent among the retarded, many more cases of idiots savants might go undetected.

Retarded in their general functioning but gifted in special areas, idiots savants need educational upgrading of learning deficits, at the same time as they need special programming to develop their special skills to the fullest. Therein lies the paradox of idiots savants and the ultimate challenge to educators of exceptional children.

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